

Abstract Submitted  
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**A fully-coupled approach to simulate three-dimensional flexible flapping wings**<sup>1</sup> TAO YANG, MINGJUN WEI, New Mexico State University — The algorithm in this study is based on a combined Eulerian description of both fluid flow and solid structure which then can be solved in a monolithic manner. Thus, the algorithm is especially suitable to solve fluid-structure interaction problems involving large and nonlinear deformation. In fact, we have successfully applied the same approach to our previous study of two-dimensional pitching-and-plunging problems and found many unique features from the passive pitching introduced by wing flexibility. With the current non-trivial extension of the algorithm to three-dimensional configuration, we can eventually reveal the complex vortex and structural dynamics behind the amazing performance of nature's fliers such as hummingbirds.

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